

REMARKS

I. Introduction

With the addition of claim 49, claims 23 to 49 are pending in the present application. Claims 23 to 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,739,909 (“Blayo”) in view of U.S. Patent No. 5,539,241 (“Abidi”). Claims 38 to 42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Blayo in view of Abidi, and in further view of U.S. Patent No. 5,126,284 (“Curran”). Claims 43 to 48 are allowed.

II. The rejection under 35 U.S.C. § 103(a) with respect to Claims 23 to 37 should be withdrawn

Claims 23 to 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Blayo in view of Abidi. Applicants respectfully submit that claims 23 to 37 are allowable for the following reasons.

To reject a claim as obvious under 35 U.S.C. § 103, the prior art must disclose or suggest each claim element and it must also provide a motivation or suggestion for combining the elements in the manner contemplated by the claim. See Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 934 (Fed. Cir. 1990), cert. denied, 111 S. Ct. 296 (1990); In re Bond, 910 F.2d 831, 834 (Fed. Cir. 1990). Thus, the “problem confronted by the inventor must be considered in determining whether it would have been obvious to combine the references in order to solve the problem.” Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675, 679 (Fed. Cir. 1998).

Claim 23 relates to a device for determining an extent of an at least locally etched lateral undercut of a structured surface layer on a sacrificial layer, including at least one passive electronic component arranged on the structured surface layer and in the shape of a coil. Claim 23 recites that the at least one passive electronic component is configured to determine a physical measured quantity that is proportional to the extent of the at least locally etched lateral undercut of the structured surface layer on the sacrificial layer.

The Office Action cites to column 1, lines 14 and 23 to 34, and Figures 1 and 2 of Blayo as teaching a device for determining an extent of undercut of a structured surface on a sacrificial layer, and the Office Action cites to workpiece 40 (the semiconductor device itself) in Blayo as the passive electronic component arranged on the structured surface layer for determining a physical measured quantity that is proportional to the extent of the lateral

undercut. Applicants respectfully disagree and submit that the workpiece 40 (the semiconductor device) of Blayo is not the same as the passive electronic component of the claimed invention, and that the passages cited by the Office Action merely explain the anisotropic plasma etching process generally. Instead, what is etched according to Blayo are always parts of the structured surface layer itself. In this regard, Figure 2 of Blayo does not show any undercutting of the structure at all, that is, a self-supporting structure does not exist even regionally. Depending on the strength of the anisotropy, however, there may be, for example, undercutting of the mask. (See, for example, step 324 of Figure 3a of Blayo). Figure 3B shows the ideal case of an anisotropic etching process having vertical walls. There is also the instance where the width of the feature 320 is wider at the bottom than at the upper mask location. Regardless, the layer below the “feature” 320 is never etched; the contrary would be the case, if in Blayo the substrate 330 in Figure 3A or the substrate 360 in Figure 3b below structures 320 or 350 were removed. However, since Blayo does not provide for undercutting the structures 320 and 350, there is also no sacrificial layer below the structure layer. Consequently, the extent of the undercutting of the structured surface layer cannot be determined at all. In other words, the ellipsometry device of Blayo **cannot be used to determine the proportional quantity of undercut**, but is instead used to measure the width of periodic features (col. 2, lines 44 to 46; col. 3 line 5) during the etching process. As stated on Page 2 of the specification of the present application, the passive electronic component is delineated out from the surface layer and is used to determine a proportional quantity of undercut. Accordingly, Applicants' invention is distinctly different in that it measures the extent of undercut in a second etching process involving an at least locally etched lateral undercut of the structured layer on a sacrificial layer, as recited in claim 23. In addition, Abidi clearly fails to teach or suggest the above-recited limitation of claim 23 since, with the inductors 12 embedded in a bridge structure 18, there is no lateral undercutting of the structure on a sacrificial layer at all. (See col. 3, lines 24 to 26 and Figures 6a to 6c)

Furthermore, as the Office Action clearly acknowledges, Blayo fails to teach a coil shaped passive electronic component on a structured surface layer. Instead, the Office Action relies on Abidi for teaching a coil-like component, and the Office Action asserts that “it would have been obvious to one of ordinary skill in the art to incorporate a passive electronic component in a shape of a coil in the Blayo semiconductor device, because the coil has a self resonant frequency.” (Office Action, page 3).

Initially, Applicants submit that Abidi is a non-analogous art. Abidi is directed towards a monolithic structure with enhanced self-resonance of an inductor for, in particular, RF-tuned amplifiers. (Col. 8, lines 35-44). While Abidi may disclose the method of fabricating such a device using etching or other micro-machining techniques, Abidi does not disclose a device for measuring undercut of a structured surface, as recited in the claims. Abidi teaches a structure with reduced parasitic capacitance, not a device having a sacrificial layer with trenches that form an undercut of a structured surface arranged thereon, as recited in claim 23.

Moreover, Applicants submit one of ordinary skill in the art would not be motivated to combine the asserted references, and there is no suggestion in either reference to do so. In order to render obvious the claims at issue, there must be some suggestion or motivation to modify or combine reference teachings. In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

Blayo discloses a device for measuring and controlling line widths in periodic structures using spectroscopic ellipsometry, and Abidi discloses a monolithic passive component to increase inductance and reduce parasitic capacitance. Even if one of ordinary skill were to combine the pertinent structures of the two devices, the resulting combination would not approximate Applicants' invention. Applicants' invention measures the reduced capacitance from the undercutting of the sacrificial layer. Undercutting the dielectric layer 20 of Abidi would destroy the structure supporting the metallization lines (74 and 76). Since the asserted combination would render the combined prior art unsuitable for their original intended purposes, the obviousness conclusion is unsupported by the combined references. MPEP 2143.01.

More importantly, since the inductors 12 of Abidi are located in the bridge structure 18 such that there is no provision to undercut the inductors 12 themselves, there is no motivation to measure the structure using the ellipsometer from Blayo (or to use any device at all). Moreover, even if the inductors 12 of Abidi were directly lying on a sacrificial layer and were undercut (which is not disclosed), Blayo does not teach how technically the extent of a lateral undercutting can be derived from the measured ellipsometer angles delta and chi. It is also respectfully submitted that it is not technically possible to measure the frequency of resonance of an inductor or an LC combination using an ellipsometer.

More importantly still, Abidi teaches away from a device according to Applicants' invention because Abidi teaches an etching process that uses the silicon dioxide layer as a

mask during the etching process, in which only the silicon substrate gets etched not the dielectric layer. (Col, 6, lines 1-17). This is clearly different than the sacrificial layer of the Applicants' invention, which is undercut during an etching process.

In view of the above, Applicants respectfully submit that claims 23 and its dependent claims 24 to 37 are not obvious in view of the combination of Blayo and Abidi, and the rejection of claims 23 to 37 should be withdrawn.

III. The rejection under 35 U.S.C. § 103(a) with respect to Claims 38-42 should be withdrawn

Claims 38 to 42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Blayo in view of Abidi, and further in view of Curran.

It is respectfully submitted that even if it were proper to combine the references as suggested (which is not conceded), the Curran reference does not cure the deficiencies of the Abidi and Blayo references (as explained above) with respect to claim 23, from which claims 38 to 42 ultimately depend. Indeed, the Office Action does not allege that it does. Accordingly, it is respectfully submitted that dependent claims 38 to 42 are allowable at least for the same reasons that claim 23 is allowable. Withdrawal of the rejection of claims 38 to 42 is therefore respectfully requested.

IV. New Claim 49

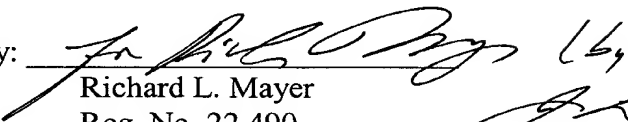
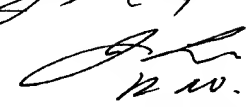
New claim 49 does not add any new matter and is fully supported by the present application, including the Specification. Claim 49 recites limitations analogous to claim 23 and is therefore allowable for at least the same reasons as claim 23.

Conclusion

In light of the foregoing, Applicants assert that the present invention is new, non-obvious, and useful. Furthermore, all issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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By:  16,
Richard L. Mayer
Reg. No. 22,490

12 Nov.
36,197)

KENYON & KENYON
One Broadway
New York, NY 10004
(212) 425-7200

CUSTOMER NO. 26646
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